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NOMAD

ATTN: JOHN PARANGOSKY FROM N. E. NELSON

I DISCUSSED THE U-2R DESIGN PROPOSAL WITH VARIOUS MEMBERS OF KELLY J'S STAFF ON FRIDAY 25 MARCH. THE FOLLOWING OBSERVATIONS AND COMMENTS ARE OFFERED:

A. THE AIRCRAFT IS A DIRECT SCALE UP OF THE U-2 AIRCRAFT EMPLOYING 1000 SQ. FEET OF WING AREA IN LIEU OF THE ORIGINAL 600 AND A PROPORTIONATELY LARGER HORIZONTAL TAIL. THE VERTICAL TAIL IS NOT SCALED UP QUITE AS MUCH SINCE THE FUSELAGE IS NOT DIRECTLY SCALED UP IN VOLUME AND, THEREFORE, LESS PROPORTIONAL TAIL VOLUME IS REQUIRED. THE INLET IS IDENTICAL TO THAT FLIGHT TESTED ON THE U-2G WITH THE SAME J75P-13B ENGINE.

VERT. TAIL IDENTICAL TO PRESENT U-2 PER Pg. 24 OF PROPOSAL

B. THE INTERNAL VOLUME FOR EQUIPMENT HAS BEEN INCREASED BY 77 CUBIC FEET WHICH WOULD PERMIT INSTALLATION OF MOST OF THE PRESENT AND CONTEMPLATED PACKAGES AND SENSORS. THERE ARE ALSO ADEQUATE PROVISIONS FOR INSTALLATION OF EWS GEAR.

C. THE LARGER VOLUME COCKPIT SHOULD PROVIDE INCREASED

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COMFORT FOR THE PILOT. HOWEVER, THIS HAS NOT BEEN CONSIDERED BY LAC UP TO NOW. I REQUESTED THAT THEY FURTHER STUDY COCKPIT LAYOUT TO TAKE ADVANTAGE OF THE CHANGES IN ADDED COMFORT AND TO LOOK INTO A MORE MODERN INSTRUMENT PANEL LAYOUT.

D. THE NOSE OF THE AIRCRAFT HAS BEEN INCREASED CONSIDERABLY IN VOLUME WHICH WILL DEFINITELY PERMIT FLEXIBILITY IN NEW PAYLOADS SUCH AS THOSE SHOWN IN THE PROPOSAL.

E. IN THE NEW PERFORMANCE CALCULATIONS, LAC HAS TAKEN ADVANTAGE OF THE SMALLER RELATIVE FUSELAGE CROSS SECTION TO REDUCE THE PARASITE DRAG COEFFICIENT FROM .0187 (U-2C) TO .0183 (U-2R). THIS, OF COURSE, WILL ACCOUNT FOR SOME INCREASED IN RANGE, IN THE ORDER OF 50 MILES, BUT IS NOT SUBSTANTIATED BY NEW WIND TUNNEL WORK. THE ADDED WING AREA OF 400 SQ. FT. HAS REDUCED THE WING LOADING OF THE AIRCRAFT TO THE POINT WHERE THE CRUISE LIFT COEFFICIENT, C/L, EQUALS .6 RATHER THAN THE 1.0 ON THE U-2C. THIS ALONE WILL IMPROVE THE TOTAL DRAG COEFFICIENT SINCE THE DRAG DUE TO LIFT AT THE LOWER LIFT COEFFICIENT WILL BE IMPROVED. IN ADDITION, THE LOWER C/L WILL GIVE THE AIRPLANE A WIDER MARGIN BETWEEN STALL AND MACH BUFFET AT ALTITUDE. THE PRESENT U-2, AT C/L EQUALS 1.0 IS CLOSE TO STALL AND DUE TO THE HIGH ANGLE OF ATTACK, IS CLOSE TO MACH BUFFET. THIS IS A DEFINITE PLUS. I HAVE ASKED THEM TO SUBMIT A CURVE, SIMILAR TO PAGE EIGHT (8), FOR THE U-2R. THERE IS ONE SMALL CHANGE IN PERFORMANCE OVER THAT SUBMITTED, I.E.: ON PAGE FIFTEEN (15) THE MAXIMUM RANGE IS QUOTED AS [redacted] THE 25X1 WHITCOMB (NASA) WING WAS CONSIDERED IN THIS REDESIGN, AND SOME

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WIND TUNNEL WORK DONE, BUT WHEN CONSIDERED FROM AN OVERALL STAND-POINT, THE PRESENT TESTED U-2 AIRFOIL TURNED OUT SUPERIOR. THE WHITCOMB WING, WHILE SUPERIOR AERODYNAMICALLY, LOST OUT DUE TO THE EXTRA WGT REQUIRED FOR THE SLATS AND FLAPS WHICH MORE THAN OFFSET THE PROFILE DRAG IMPROVEMENT.

F. THERE HAS BEEN NO WIND TUNNEL WORK DONE ON THE U-2R CONFIG-URATION, OTHER THAN THE AIRFOIL WORK DONE SOME TIME AGO ON POSSIBLE NEW WING SECTIONS. THE U-2R, AS PRESENTED, IS TAKEN DIRECTLY FROM THE OLD U-2 WIND TUNNEL AND FLIGHT TEST DATA AND MERELY SCALED UP TO A LARGER SIZE. THERE IS NOTHING WRONG WITH THIS APPROACH, AND IT SHOULD BE CONSIDERED VERY SAFE AND CONSERVATIVE.

G. AT THE PRESENT TIME, THERE ARE APPROXIMATELY THREE FULL-TIME PEOPLE ON THIS PROJECT IN PRELIMINARY DESIGN. [redacted] IS IN CHARGE. HE WAS THE CHIEF WGT MAN ON OXCART. [redacted] DID THE AERODYNAMICS. [redacted] DID THE INLET WHICH IS IDENTICAL TO THE FLIGHT TESTED U-2G INLET. THIS INLET TESTED OUT VERY WELL WITH EXCELLENT RECOVERY AND MINIMUM DISTORTION. THE PROGRAM IS NOT ACTIVE IN AERO-THERMO AT THIS TIME. THE MAJORITY OF THE WORK GOING ON IN PRELIMINARY DESIGN IS INSTALLATIONS AND ASSOCIATED PROBLEMS OF POWER REQUIREMENTS AND SPACE. THE WEIGHT BREAKDOWN DONE BY [redacted] LOOKS ADEQUATE.

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H. WITH REGARD TO PAYLOAD, I BELIEVE WE SHOULD CONSIDER THIS AIR-CRAFT ONLY WITH A MODERN CAMERA SYSTEM SUCH AS THE P.E. TYPE IC. THIS PROPOSAL CONTAINS A Q BAY FOR THE "B" CAMERA, WHICH SHOULD NOT BE CON-SIDERED ADEQUATE. IT IS SUGGESTED THAT A Q BAY ADEQUATE FOR A STABILIZED TYPE I BE ONE OF THE CRITERIA FOR FAVORABLE CONSIDERATION OF THIS PROPOSAL.

END OF MESSAGE